

# Mountain Biosphere Reserves – A People Centred Approach that also Links Global Knowledge

**Thomas Schaaf**, Division of Ecological and Earth Sciences, UNESCO, Paris, France. [t.schaaf@unesco.org](mailto:t.schaaf@unesco.org)

**U**NESCO's Programme on Man and the Biosphere (MAB) has established biosphere reserves to combine biodiversity conservation with sustainable development at local and community levels. To date 531 biosphere reserves have been established in 105 countries. Each biosphere reserve provides a living laboratory for scientific studies of the ecosystem and interactions between humans and their environment. These will eventually help us understand the mechanics of global climate change.

## **Biosphere reserves – a people-centred model of sustainability**

Economic development, social development, and environmental protection are the three mutually facilitating pillars of the MAB biosphere reserves. They together form the keystone of sustainable development. Biodiversity conservation is combined with local and community-based development in the reserves and these are reinforced by scientific studies on human-environment interactions and ecosystem studies.

Holistic economic and environmental management plans that protect natural resources also allow for sustainable economic activities for the local population. In this way there are fewer land-use conflicts, and sustainable land management practices can be determined jointly by local stakeholders, scientists, and government officials based upon scientific spatial analysis.

## **Mountain biodiversity around the world – a people-centred approach**

Forty per cent of all biosphere reserves are in mountain areas. Spectacular scenery, the many rare and

endangered plant and animal species, rich cultural diversity, and local handicrafts help to make mountain areas key destination sites for tourism. When local communities benefit from the income generated by tourists who respect the environment, biodiversity conservation and community livelihoods can be mutually reinforcing, resulting in win-win situations.

The following examples of biosphere reserves from around the world show that biodiversity conservation and sustainable development can work hand-in-hand to improve community livelihoods. All that is needed is a holistic, integrated approach and acknowledgement of the need for environmental conservation and community livelihoods.

**“Economic development, social development, and environmental protection are the mutually facilitating pillars of the MAB biosphere reserves”**

Ecotourism activities in the Issyk-Kul Biosphere Reserve in Kyrgyzstan include demonstrations of eagle hunting as well as the production and marketing of felt carpets using traditional designs.

The Dana Biosphere Reserve in Jordan uses the slogan ‘caring for nature, caring for people’. It uses an inter-related ecotourism approach and organic farming



Katunsky Biosphere Reserve landscape, Russia

schemes for the local population so that organic fruits and vegetables can be sold to upscale hotels in the capital.

The Bia Biosphere Reserve in Ghana has quite an original income-generating scheme. Three local villages have been granted licences to collect the African giant snail (*Acatina acatina*) which is found in abundance in the reserve. Some of the money collected is used to protect the area and the rest is returned to the villages for community-based projects (e.g., for water pumps or improving school buildings).

The Entlebuch Biosphere Reserve in Switzerland is home to 17,000 people; and they are engaged in promotion of 'Entlebuch Biosphere Products' such as cheese, ham, and spirits as well as cultivating natural resources and developing ecotourism. Local establishments use 'Entlebuch Biosphere' labels for high quality products.

The Mount Arrowsmith Biosphere Reserve, on the east coast of Vancouver Island in British Columbia (Canada), has introduced its own currency – the Oceanside Dollar. Tourists can buy them (at an exchange rate of 1 to 1 with the Canadian Dollar) to pay hotel bills and buy

other items. The idea behind this scheme is that some tourists, if not all, will take the Oceanside Dollar home as a collector's item, adding to the net inflow of cash to the reserve.

### **For the long term – mountains as fragile indicators of change**

The sensitivity of mountains to climate change and other changes taking place globally makes them ideal places for research into the impacts of such changes. Zonal vegetation belts vary with altitude and are likely to shift upwards with global warming, making them good indicators. Similarly, changing precipitation patterns will alter water runoff and water storage in the surrounding

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lowlands. The socioeconomic well-being of people in the mountains will also be affected as the climate changes.

No systematic studies of the impacts of global change on mountain environments have been carried out so far. This situation is changing and biosphere reserves are helping in this process. Recognition of the importance of mountain environments first came in 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro. Mountains were identified as 'fragile ecosystems'. Important as this was, a coherent and coordinated approach to studying the principal mountain ranges of the world was still needed. Managers of mountain biosphere reserves and scientists came to a consensus about collaboration on global change issues in the mountains at the Perth Declaration in October 2005. That same year they promoted the Global Change in Mountain Regions (GLOCHAMORE) Research Strategy as a blueprint for research into the impacts of global change in the mountains: this was intended to guide managers of mountain biosphere reserves and scientists. The GLOCHAMORE Research Strategy facilitates the distribution of information through a harmonised methodology.

The UNESCO Man and the Biosphere (MAB) Programme contributed to the GLOCHAMORE Project by mobilising site managers of mountain biosphere reserves. Biosphere reserves have collected climate data and species' lists over the long term so that they can be monitored over time to analyse impacts on them from global warming. Moreover, people live and make a living in biosphere reserves; hence the repercussions of global warming on local mountain economies and standards of living can be assessed.

## Looking ahead – understanding climate change by linking global knowledge

UNESCO-MAB is promoting a project on 'Global Climate Change in Mountain Sites (GLOCHAMOST) which will examine and work out adaptation strategies in biosphere reserves and put the GLOCHAMORE Research Strategy into practice. GLOCHAMOST will foster collaboration and communication in both industrialised and developing countries around the world as well as facilitating collaboration among researchers, managers of mountain biosphere reserves, and mountain communities affected by global change. Mountain scholars, scientists carrying out research into global change, and managers of mountain biosphere reserves will bring together the knowledge available and carry out research to improve the overall understanding of change in mountain regions. This way, GLOCHAMOST is poised to carry out research in mountain areas in the collaborative spirit of the Perth Declaration.

“More efforts are needed to increase the number of these reserves in the region”

The Nanda Devi Biosphere Reserve is the only UNESCO network biosphere reserve in the Hindu Kush-Himalayas; more efforts are needed to increase the number of these reserves in the region. There are many national efforts in line with the UNESCO Biosphere Reserve Programme in the region where the same principles, concepts, and management of biosphere reserves are followed, without the sites being nominated as UNESCO sites. For example, India has established many biosphere reserves on their own initiative. We expect more UNESCO Mountain Biosphere Reserve sites will be evident in the Hindu Kush-Himalayas in the near future.

Participatory planning gives mutual learning opportunities

